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## NEW ANTHOPHORID BEES FROM CALIFORNIA (HYMENOPTERA)

By P. H. TIMBERLAKE

The types of the new species here described are in the collection of the American Museum, paratypes unless otherwise mentioned in collection of Citrus Experiment Station.

### *Emphoropsis pallida*, new species

The female of *pallida* differs from all our other species in having the clypeus, supraclypeal mark and a small spot on mandibles creamy white. Both sexes also differ from other species in having the pubescence of the abdomen almost entirely appressed.

FEMALE.—Black, the apical margin of tergites 1 to 4 rather broadly rufescent. Tarsi, tibial spurs and tegulae ferruginous. Spot on mandible before the middle (often enlarged to form a streak from inner basal corner to beyond the middle), large portion of clypeus and a transverse supraclypeal mark, sharply pointed at each end, creamy white. Clypeus black around the margin, except dorsally, the black margin being more or less broadened on each side above, sometimes to such an extent that the white mark becomes a thick-limbed T. In one paratype there is a small white spot on each side of face anteriorly, opposite the middle of clypeus. Pubescence grayish white, very dense and rather short on thorax, thinner on the face below the ocellar tuft, but very dense on the cheeks and occipital margin. Sometimes there are a few black hairs intermixed in the ocellar tuft and on the anterior part of the mesoscutum. Disk of first tergite with erect grayish-white hair, which becomes appressed and dense at each side and on apical margin. Following tergites with a fine short appressed whitish pubescence, with a few erect pale hairs intermixed, especially on segments 3 and 4. Base of tergites 2 to 4 with very short black hair. Hair at apex of tergite 5 very dense and whitish, but the hair on each side of the pygidial plate golden. Hair of legs mainly white, the scopal hairs of hind tibiae clear and shiny, but the hair at apex on outer side of front and middle tibiae and on anterior margin of the latter, pale fulvous. Hair on anterior margin of front tibiae, on front tarsi, under side of middle and hind tarsi and inner side of hind tibiae more or less bright ferruginous, becoming especially brilliant on the hind basitarsi. Apical tuft on hind basitarsus fuscous, blacker at tip. Clypeus somewhat shiny with close shallow punctures. Hairy part of face and vertex very finely and densely punctured, but the nude area on each side of ocellar area impunctate. Mesoscutum dull, densely and finely punctured, the punctures becoming sparse and the surface distinctly tessellate in a small area on the posterior middle of disk. Scutellum with a similar sculpture, with the punctures exceedingly dense and less distinct. Antennae black, the third joint about equalling the three following joints combined. Wings slightly

smoky, subhyaline, the veins black. Length, 13 to 15 mm.; anterior wing, 10.5 to 11 mm.

MALE.—Similar, but basitarsi of all legs blackish, and apex of tergites broadly whitish subhyaline, preceded by a narrow rufescent band. Mandibles on outer side, except apex, clypeus except a black dot on each side above and a dot on each suture opposite the discal dots, a rather broad supraclypeal mark widened in middle, large lateral marks, concave above and reaching along orbits slightly above the level of antennae, and scape broadly beneath, creamy white. Pubescence, except for the usual sexual differences, as in the female, but hair on sides of last tergites and at apex of front and middle tibiae whitish. Basal half of tergites 2 to 4 and basal margin of tergites 5 and 6 with fine appressed black hair, the pale hair being mostly confined to the pallescent apical border, the abdomen thus much more distinctly banded than in the female. Rarely there are a few brownish hairs intermixed on vertex and mesoscutum. Clypeus usually smooth and shining, with rather sparse fine punctures. Sculpture otherwise as in the female. Pygidial area of tergite 7 broadly truncate at apex, its disk rather shiny, finely punctured on each side. Antennae short, the third joint nearly as long as joint 4 plus 5. Length, 11 to 14 mm., anterior wing, 9 to 10 mm.

Holotype female and allotype collected on *Larrea divaricata*, three miles east of Edom, Riverside County, California, March 8, 1936 (Timberlake). The following paratypes have also been studied: 12 ♂, 2 ♀, from type locality (Timberlake); 6 ♂, from type locality (Linsley) in Linsley collection; 9 ♂, 2 ♀, from type locality (F. R. Platt), in Platt collection; 2 ♀, 2 miles south of Oasis, Riverside County, on *Larrea*, March 7, (Timberlake and Linsley); 1 ♀, 7 miles north of Palm Springs, on *Larrea*, March 17; 2 ♂, Palm Springs, on *Phacelia distans* and *Larrea*, March 21 and 26; 1 ♂, 4½ miles northwest of Indio, on *Larrea*, March 8; 1 ♀, Edom, on *Larrea*, March 28 (Linsley) in Linsley collection; 1 ♂, Borego Valley, San Diego County, on *Chaenactis stevioides*, March 26; 1 ♂, 1 ♀, Andrade, Imperial County, ♀ found dead on ground (Franklin Woodward), ♂ on *Larrea*, March 6 (Cockerell), in Cockerell collection; 5 ♂, Needles, San Bernardino County, Dec. 21, 1921 (J. A. Kusche), in collection of California Academy of Sciences; and 2 ♂, Buckeye, Maricopa County, Arizona, on *Lycium torreyi*, March 28.

#### *Emphoropsis dammersi*, new species

This is similar to *E. depressa* (Fowler), but it has the light hair of abdomen erect instead of depressed, the face markings of the male dark yellow instead of white, and the female usually has a small yellow spot (entirely lacking in *depressa*) on each side of the face between the clypeus and the eye margin.

FEMALE.—Black, the femora more or less rufescent. Tibial spurs pale ferruginous, that of the middle tibia strongly curved at apex. A dot at inner basal corner of mandibles, small spot (rarely absent) on anterior sides of face between clypeus

and eye margin, and sometimes a supraclypeal line, yellow. Hair of head and thorax pale fulvo-ochreous or tawny ochreous, becoming white on cheeks, occipital margin, lower part of pleura, sternum and propodeum, and strongly intermixed with black hairs on face, vertex, mesonotum and upper part of pleura. Hair of abdomen erect, long on disk of first tergite, short on following segments, cinereous or a little tinged with tawny and strongly intermixed with black hairs. On tergite 1 the black hairs are mostly confined to apical margin. Hair at apex of tergite 3 and on disk of 4 longer, becoming depressed at apex of 4, that in the middle of apical margin of 4 cinereous, not mixed with black, although there are many black hairs on each side. Dense hair at apex of tergite 5 black, overlaid with gray hairs proceeding from the basal part of segment. Hair at each side of pygidium black. Hair of venter pale ochreous or whitish, forming a long apical fringe on each segment, but hair at apex of segment 6 and some hair on the middle of the disk of 5, preceding the fringe, black. Hair of legs whitish, or more or less tinged with ochreous, with much fuscous or black hair on outer side of middle tibiae and on outer margin of hind tibiae except at apex. The short apical tuft of hind femora and the usual apical tuft of hind basitarsi also black. Hair on inner side of tarsi ferruginous, that of middle and hind basitarsi very bright, but margined with black hair on each side of hind pair. Clypeus dullish, densely and shallowly punctured. Sides of face and ocellar region finely and densely punctured. Mesoscutum finely and densely punctured except in two small areas, one on each side of median line posteriorly, where the punctures are sparse and the surface between the punctures delicately tessillate and rather shiny. Scutellum similarly sculptured. Antennae black, the 3rd joint a little longer than the following three joints combined. Tegulae black, shining, very minutely punctured. Wings rather strongly tinged with fuscous, the veins black. Length, 13.5 to 16 mm., anterior wing, 11 to 11.5 mm.

**MALE.**—Similar, but legs black, the tibial spurs pale ferruginous. Large mark on mandibles, clypeus, supraclypeal mark widened in middle, lateral marks concave above and reaching on the orbits to level of the middle of antennal sockets and scape broadly beneath, deep yellow, almost orange-yellow. Anterior margin of clypeus narrowly brown and a small triangular mark, subtended by the suture on each side above, black. Pubescence much as in the female, with much black hair intermixed on face, vertex, mesonotum, upper part of pleura and tergum. Hair of abdomen, especially the black hairs, somewhat longer than in the female. Seventh tergite broadly truncate at apex, its disk densely covered with appressed golden pubescence, changing to ferruginous and then to fuscous at apex. Hair of venter entirely light. Hair of legs light, except for a few black hairs on front and middle femora and tibiae. Hair on inner side of tarsi bright ferruginous. Clypeus a little dullish, finely and obscurely punctured. Antennae reaching to apex of scutellum, the third joint barely longer than the fourth. Length, 12 to 15 mm., anterior wing, 10 to 10.8 mm.

Holotype female and allotype collected at flowers of *Arctostaphylos glauca*, Cajon Canyon, San Bernardino County, California, at elevation of about 3500 feet, Feb. 28, 1936 (Timberlake).

The following paratypes unless otherwise mentioned are in the collection of the Citrus Experiment Station: 44 ♂, 14 ♀ taken with the types; 27 ♂, 13 ♀ from the type locality, Feb. 25 and 28 (F. R. Platt),

in the Platt collection; 1 ♀ taken at the type locality in Cajon Canyon, at flowers of manzanita, March 31, 1933 (C. M. Dammers); 2 ♀, taken on damp ground, Keen Camp, San Jacinto Mountains, Riverside County, April 2, 1933 (C. M. Dammers); 1 ♀, Lone Pine Canyon, San Bernardino County, in March (C. M. Dammers), in the Dammers collection; and 6 ♀, 8 miles south of Temecula, Riverside County, on *Ceanothus* (collecting pollen), March 5, 1936 (F. R. Platt), in Platt collection.

This species is named in honor of Commander C. M. Dammers, who brought me the first specimens seen of this fine species.

***Anthophora cockerelli*, new species**

A *Micranthophora* most closely allied to *A. flexipes* Cresson and *A. albata* Cresson. The male may be distinguished by the very long, slender, simple legs, by the face below antennae entirely yellow and almost nude, by the yellow scape and pale ferruginous flagellum. The female also has the face below antennae nearly all yellow and the scape yellow in front, by which characters it may be distinguished from all our other species.

**MALE.**—Black. Mandibles except the reddish apical teeth, labrum except two hyaline dots at base, entire face below antennae, and scape except above, rather pale yellow or almost cream color. Second and third joints of antennae black, the rest of flagellum pale ferruginous, slightly dusky above toward the base and at the articulations. Legs entirely dark, except base of claws and sometimes apex of last joint of tarsi more or less, ferruginous. Smooth depressed apical margin of tergites inconspicuously subtestaceous. Sixth ventrite brownish testaceous. Tegulae pale amber color. Wings clear hyaline. Basal half of venation ferruginous, the veins of the apical cells more brownish. Eyes yellowish green. Hair of head and thorax fulvo-ochraceous, rather short and dense, becoming paler and depressed on frons. Face below antennae almost nude. First three tergites with short appressed fulvo-ochraceous pubescence, longer on the first segment and becoming erect toward the base of that segment. Following tergites with fine fuscous or black hair, sometimes with more or less light hair intermixed, the sides of tergite 4 showing considerable light hair in one specimen. Venter almost nude, except the fifth segment which has a rather dense, short and blackish pubescence. Front and middle legs without long hairs except a very thin fringe on front tarsi behind. Front femora entirely nude and middle pair mostly so, but with a streak of brownish ochraceous pile on posterior margin and on basal half of anterior surface. Exterior surface of all the tibiae, under side of hind coxae and an area on sternum just in front of hind coxae, with dense appressed silvery white hair. Hind trochanters with similar or sometimes with brownish hair. Under side of hind femora and tibiae fringed with long dark brown or blackish hair, which is denser on the tibiae. Tarsi with black pubescence, which is long and more brownish on inner side of hind basitarsi. Front basitarsi with thin whitish appressed pubescence on outer side. Middle basitarsi with longer, erect, fine bristle-like hairs intermixed with the black on outer side.

Eyes large, strongly divergent above. Clypeus prominent and very convex for this group. Labrum trilobate at apex. Mandibles strongly and sharply bidentate



the inner tooth not much less than half as large as the other and divergent. Antennae short, the third joint only slightly longer than joint 4 plus 5, and the joints of flagellum except the last no longer than wide. Seventh tergite weakly and obtusely angulate on each side at base, and with the apical middle slightly produced, broadly truncate and weakly notched medially, but apex not distinctly bilobate. Fifth ventrite very large and almost concealing the sixth, the latter broadly emarginate at apex.

Front and middle legs, including femora, very slender, the middle pair extremely long. Front tarsi not distorted, the basitarsus almost as long as tibia. Middle tarsi very long and slender, the basitarsus longer than the tibia, slightly curved and about equal to following tarsal joints combined. Hind legs comparatively short and about normal for group. Spurs of middle and hind tibiae small and normal (strongly enlarged and modified in *flexipes*). Venation as in *flexipes*. Nude part of face microscopically shagreened and somewhat dullish, not distinctly punctured. Labrum shining and with sparse indistinct punctures. Vertex behind ocelli densely and finely punctured, the area between the ocelli sparsely punctured. Concave space between lateral ocelli and eyes shining and microscopically punctulate. Thorax closely punctured like the vertex, mesoscutum more densely so, but with two oval impunctate shining spaces on the posterior middle of disk. Length, about 9 mm., anterior wing, 6.9 mm.

FEMALE.—Similar to male except for usual sexual characters. Face markings rather bright yellow, not quite covering space below antennae, the black descending along orbits nearly to level of middle of clypeus. Lateral marks oblique, not notched above. Supraclypeal mark angulately widened in middle. Flagellum darker ferruginous, more dusky above, but color of antennae otherwise as in the male. Pygidium reddish. Pubescence paler than in male, ochraceous above on head and thorax, and pale ochraceous or whitish on face, cheeks, pleura and legs. Tergites 1 to 5 very densely covered with fine appressed pale ochraceous or creamy pubescence, that on the base of 1 erect. Base of segments neither nude nor blackish. Tuft of longer hair on apex of 5 obtusely triangular, deeper ochraceous or sometimes brownish. Hair on inner side of basitarsi dark brownish ferruginous, sometimes darker or fuscous on margins of hind pair. Mandibles stouter, the teeth larger and blunt. Labrum truncate at apex, its disk somewhat rugosely punctured. Clypeus more shining than in the male, finely, closely but not very distinctly punctured. Area on each side of ocelli much more distinctly punctulate and less shining. Impunctate areas on disk of mesoscutum small. Flagellum less stout than in the male, the middle joints as long as wide. Third joint of antennae as long as the next three combined. Pygidium rather wide at base, triangular, the apex narrowly rounded, its disk with a median ridge. Length, 8.5 to 9.5 mm., anterior wing, 6.8 to 7 mm.

Described from 3 males and 14 females, at flowers of *Cleomella obtusifolia*, Mohave Desert, California (Timberlake), collected as follows: 1 ♂, 8 ♀ (holotype male and paratypes), Barstow, September 12, 1924; 1 ♀ (allotype), Barstow, October 6, 1928; 1 ♀ (paratype), Oro Grande, October 7, 1928; 1 ♂ (paratype), Black's Ranch, north of Barstow, October 1, 1928; 1 ♂ (paratype), Hodge, September 14, 1935; and 4 ♀ (paratypes), Barstow, September 14, 1935.

I take pleasure in dedicating this remarkably fine species to T. D. A. Cockerell.

***Anthophora abroniae*, new species**

The male of *abroniae* is distinguished from other described species of *Micranthophora* in having no lateral teeth on the seventh tergite, the apical teeth small and acute, the mandibles slender and simple, and the antennae entirely dark. The female is similar to *A. albata* Cresson (although the male is very different) but has the flagellum at most only obscurely reddish beneath and the mark on the clypeus triangular and pointed above. In *albata* the white mark of clypeus is a broad transverse band covering nearly the anterior half, and more or less triangularly produced above in middle to dorsal margin. It also has a supraclypeal mark, absent in *abroniae*.

MALE.—Black, with the mandibles except reddish tips, labrum except two large testaceous hyaline spots at base, and a narrow band on anterior part of clypeus, extending no farther laterad than sides of labrum and normally concealed by hair, yellowish white. Antennae black, the flagellum obscurely reddish beneath. Small joints of tarsi and apical teeth of abdomen ferruginous. Tegulae pale amber to very pale testaceous hyaline. Wings clear hyaline, the veins piceous, becoming progressively more or less ferruginous toward base of wing, the costal vein entirely ferruginous. Spurs very pale testaceous. Apical margin of tergites 1 to 6 testaceous hyaline. Eyes greenish gray when dry. Pubescence rather abundant, moderately long, silky and white, being very dense on face and concealing the surface, and somewhat shorter on thorax. Disk of mesoscutum and scutellum well exposed. Abdomen with short fine appressed and moderately dense grayish or slightly ochraceous pubescence, covering the surface of the tergum almost uniformly, and becoming longer, sparser and erect on base of first tergite. Venter with very fine appressed pale inconspicuous pubescence. Hair of legs white, very dense and appressed on outer side of tibiae and basitarsi. Front and middle femora and tibiae fringed behind with long white hair, the front tarsi with a shorter sparser fringe. Hair on under side of hind femora long and white, but that on under side of hind tibiae blackish. Tarsi beneath with bright ferruginous hair. Hind basitarsi beside the short white hair on outer surface have long white hairs on the anterior margin.

Mandibles slender and acute at apex, without an inner tooth. Labrum broadly rounded at apex, truncate in middle. Tongue very long, reaching when fully extended beyond the apex of abdomen. Antennae short, the third joint a little longer than 4 plus 5, and the middle joints of flagellum about as long as thick. Face rather wide, the eyes divergent above, and facial quadrangle about as long as width at vertex. Seventh tergite with a median carina and two small acute apical teeth, separated by a rounded notch. Latero-basal teeth absent. Sixth ventrite with a small rounded emargination in middle of apical margin. Legs ordinary. Face below antennae very finely and closely punctured, but white band on clypeus smooth and impunctate. Labrum shining, very obscurely and minutely punctured. Vertex behind ocelli and the thorax rather closely and finely punctured. Concave space between lateral ocelli and eyes minutely and closely punctulate. Mesoscutum with two oval impunctate spaces on middle of posterior part of disk. Length, 7 to 8 mm., anterior wing, 5 to 5.5 mm.

**FEMALE.**—Similar to male, but larger and more robust. Black, the mandibles except piceous apex, labrum except two large testaceous pustules at base, and a triangular mark on clypeus, yellowish white. Clypeal mark reaching outward no farther than sides of labrum, nearly equilateral in shape, with the sides distinctly concave. Tarsi, antennae and wings colored as in male. Tegulae clear amber color. Pubescence ochraceous on vertex and thorax above, sometimes slightly intermixed with dusky or blackish hairs on mesoscutum and scutellum, but these darker hairs are never conspicuous and are entirely absent in type. Face, lower part of cheeks, pleura and legs with whiter hair. Hair dense between and around antennae and on sides of face, but the pale mark on clypeus is fully exposed. Tergum of abdomen densely covered with fine appressed pale ochraceous or creamy pubescence, but base of first tergite with long erect hair. Tuft of hair at apex of tergite 5 black and rather large. Front femora with a thin whitish fringe beneath. Hind tibiae with some blackish hair beneath, especially toward apex. Tarsi beneath with rather bright ferruginous hair, but that on hind basitarsi margined with blackish, especially on anterior side. Fan of hair at apex of hind basitarsi blackish. Mandibles rather slender, with a small inner tooth. Tongue rather long, the blades of the maxillae being long, slender and hairy. When in retracted position the maxillae reach to middle coxae. Third antennal joint as long as the next three joints combined. Basal vein received behind the nervulus. First recurrent received by second submarginal cell near beginning of its last third. Pygidium reddish, rather acute at apex and with a median ridge. Clypeus finely, densely punctured, except that the pale mark is nearly impunctate. Labrum subrugose, not distinctly punctured. Sculpture otherwise much as in the male. Length, 8 to 9 mm.; anterior wing 5.9 to 6.1 mm.

Described from 30 ♂, 10 ♀ (holotype male, allotype and paratypes) collected at flowers *Abronia villosa*, Palm Springs, California, at edge of town, April 9 and 10, 1932 (Timberlake), and the following paratypes: 3 ♂, 13 ♀, Borego Valley, San Diego County, March 26, 1933 (Timberlake), males flying over ground, females entering or leaving nests; 2 ♂, 1 ♀, Edom, Riverside County, on *Abronia villosa*, March 28 and April 7, 1936 (Timberlake); 2 ♀, Coachella Valley, Riverside County, May 29, 1935 (Margaret L. Cook); 5 ♂, 4 ♀, near Buckeye, Gila River, Maricopa County, Arizona, on *Heliotropium curassavicum*, March 29, 1934 (Timberlake).

At Palm Springs the females were seen entering their burrows in the sand near the *Abronia* flowers; at Borego the bees were nesting in a community in rather hard-packed soil. The long tongue of this bee seems to be especially adapted to the long tubular flowers of *Abronia*.

#### ***Anthophora salazariae*, new species**

This species is allied to *A. abroniae* Timberlake, and the male may be distinguished by having the white fringe of hair on under side of femora shorter (about as long as thickness of femora in *salazariae* and twice as long in *abroniae*), the antennae longer, with middle joints of flagellum longer than thick, and the three

apical tergites more thinly pubescent and appearing darker than preceding segments. The female differs from *A. albata* Cresson in having the yellow clypeal band narrow, but produced above, the supraclypeal mark absent, and hair on under side of tarsi bright ferruginous. From the female of *abroniae* it differs in having the tongue shorter, fifth tergite not densely covered with pale pubescence, clypeal mark yellow, not triangular, etc.

MALE.—Black, with the mandibles except reddish tips, labrum in large part, and a short narrow band on anterior margin of clypeus, rather pale yellow. Lateral reflexed margins of labrum piceous, and the two pustules at base brownish testaceous. Flagellum brownish beneath. Small joints of tarsi and apical teeth of abdomen ferruginous. Tegulae testaceous hyaline. Depressed area at apex of tergites 1 to 6 whitish hyaline. Wings clear hyaline. Veins brownish piceous, the subcosta black, but it and other veins at extreme base of wing and approximately the basal half of costal vein, ferruginous. Eyes green. Pubescence white and silky. It is rather worn in type but apparently does not differ greatly from *abroniae*, except that the face is much less densely covered and the hair on tergites 5 to 7 is fine, appressed, but not at all feltlike, so that the surface is well exposed and appears blacker than that of preceding segments. Also the little fan of hairs surrounding the anterior ocellus is extremely thin and a large triangular area in front of the ocellus is well exposed. Hair of legs white, but light ferruginous on under side of tarsi. Unlike *abroniae*, the tibiae are not fringed with long hairs and the fringe on the femora is much shorter and sparser. Front tarsi with a few long white hairs on outer side. Hair on anterior margin of outer side of hind basitarsi not long and dense as in *abroniae*. Structurally much like *abroniae* except as follows: Eyes less strongly divergent above. Clypeus less prominent, somewhat depressed. Labrum more truncate at apex. Tongue considerably shorter. Maxillary blades rather wide at base, but tapering, with the apical fourth very narrow. Antennae longer, the joints of flagellum (except fourth antennal joint) distinctly longer than wide. Joint 3 somewhat shorter than 4 plus 5. Apical teeth of seventh tergite blunt at apex, distinctly larger and broader than in *abroniae*, but still very small in comparison with most other species. Sculpture about as in *abroniae*, except that the labrum is slightly roughened and obscurely punctured. The impunctate areas on disk of mesoscutum barely larger. Length, about 7.5 mm., anterior wing (frayed at end), about 5.4 mm.

FEMALE.—Much like the female of *abroniae* but differing as follows: Face markings somewhat deeper yellow. Anterior and lateral margins of labrum brownish or piceous. Clypeal mark in form of a narrow band, extending outward as far as sides of labrum, somewhat widened in middle but not produced above. Flagellum brownish beneath. Pubescence white, or grayish white, not at all tinted with ochraceous, the hair of mesonotum inconspicuously intermixed or tipped with fuscous. Hair on inner side of tarsi clear ferruginous, not margined with darker hair on hind basitarsi. Hair of face dense at sides and on supraclypeal area, but the black part of clypeus thinly covered with short appressed hair. Tergites 1 to 4 densely covered with whitish pubescence, but 5 with much thinner light pubescence and appearing black in contrast with preceding segments. Labrum more rugose than in *abroniae* and with a scalelike transverse carina in the middle a short distance from apex. Clypeus closely and finely punctured except on the yellow mark. The shining impunctate areas on mesoscutum somewhat larger than in *abroniae*. Tongue



shorter. Maxillary blades not hairy, wide at base and tapering to apex, and when in retracted position reaching to front coxae. Antennae somewhat longer and stouter, the third joint longer than 4 plus 5, but not equalling the next three joints combined. Length, 8 to 9 mm., anterior wing, 6.3 to 6.5 mm.

Described from 1 ♂ (holotype), at flowers of *Lupinus odoratus*, Mohave Desert, about 8 miles southwest of Victorville, California, May 22, 1932 (Timberlake); 1 ♀ (paratype), Clark Mountain, Mohave Desert, May 17, 1935 (C. M. Dammers); 2 ♀ (paratypes), Kramer Junction, Mohave Desert, May 1, 1936 (C. M. Dammers); 2 ♀ (allotype and paratype) at flowers of *Salazaria mexicana*, about 10 miles southwest of Victorville, May 17, 1930 (Timberlake), and 1 ♀ (paratype) at flowers of *Langloisia matthewsii*, at the same time and place as the two preceding specimens.

This bee is evidently not restricted to any one flower, but I have chosen to associate it by name with one of the commonest and most characteristic shrubby plants of the Mohave Desert, the flowers of which it is sure to frequent more or less regularly. It is evidently most closely allied to *A. columbariae* Timberlake and Cockerell, of which it may prove to be a subspecies. The female differs from *columbariae* in having clypeus closely, finely and distinctly punctured, flagellum brown beneath, maxillary blades ferruginous, instead of dilute fuscous, less tapering and blunter at apex (tapering to an acute point in *columbariae*), hair of vertex and mesonotum with little intermixture of dark hairs (*columbariae* from type locality having a strong intermixture of black hairs), fifth tergite less strongly contrasting with preceding segments, hair of under side of tarsi clear ferruginous, not margined with black on hind basitarsi, fan of hairs at apex of hind basitarsi more or less ferruginous, instead of black. The male differs in having hair of last three tergites light instead of black, but allowing the black integument to show plainly, no intermixture of dark hairs on vertex and mesonotum, small joints of tarsi clear ferruginous, hair on under side of tarsi clearer ferruginous, flagellum reddish brown beneath, blades of maxillae more ferruginous, wings clearer hyaline, mandibles with inner tooth weakly developed (short and small, but separated from shaft by a distinct notch in *columbariae*).

A male from Deep Creek, Mohave Desert, May 5, 1936, at flowers of *Eriodictyon*, although classified as *columbariae* might be referred to either species. It has flagellum brown beneath, the notch separating inner tooth of mandible very weak, vertex and mesonotum with a few dark hairs intermixed, and hair of last three tergites mainly black. It

has the clypeus entirely black (in *columbariae* the pale clypeal band may be present or absent). This specimen is probably an indication that the two species intergrade, yet a female from Deep Creek is a typical *columbariae*.

***Anthophora mortuaria*, new species**

Like the two preceding species (and also *A. columbariae* Timberlake and Cockerell) this species belongs to that section of *Micranthophora* typified by *A. pachyodonta* Cockerell. *Mortuaria* bears about the same relationship to *pachyodonta* that *salariae* does to *columbariae*. Both *pachyodonta* and *mortuaria* are distinguished from the other species here described by having the two teeth at apex of male abdomen comparatively large and broad, and the inner tooth of the mandible strongly developed. The male of *mortuaria* is distinguished from *pachyodonta* by having mesoscutum densely punctured with two small impunctate areas on middle of disk (densely punctured all over in *pachyodonta*), face markings yellowish white instead of bright yellow, pubescence ochraceous to fulvo-ochraceous instead of white, and scape black only above. The female differs from *A. xanthochlora* Cockerell (which after all must be considered the female of *pachyodonta*), in having the face markings whitish, the scape entirely pale beneath, the pubescence more richly colored, and the triangular patch of hair on the fifth tergite black instead of pale fulvous.

**MALE.**—Black, with mandibles except piceous tips, labrum except small hyaline spot on each side of base, broad band on clypeus, and scape broadly beneath, pale yellowish white. Pale band on clypeus reaching to eyes and broadly arched above, where in the middle it reaches slightly above the center of clypeus. A slender median streak on dorsal part of clypeus and a narrow transverse supraclypeal mark, white but normally concealed by the dense hair. Flagellum obscurely reddish beneath. Tarsi dark, the small joints obscurely dark ferruginous. Apical lobes of seventh tergite ferruginous. Tegulae amber color. Wings clear hyaline, the veins piceous, the costal vein ferruginous on basal half. Tibial spurs pale testaceous. Apical margin of tergites 1 to 6 testaceous hyaline. Pubescence silky, abundant, ochraceous, varying to pale ochraceous, becoming white on face, cheeks and occiput, or sometimes becoming a rich ochraceous brown on all parts except the face. Hair of face very dense and more or less white. Anterior part of clypeus nude, but overhung and more or less concealed by the facial hair. Vertex and disk of mesoscutum with sparser hair than other parts, the surface well exposed. Disk of tergites 1 to 6 entirely covered with fine appressed feltlike pubescence, the base of 1 with the usual longer erect hair. Hair of legs concolorous with that of body, very dense and appressed on outer side of tibiae and basitarsi. Femora and front tibiae fringed behind with moderately long and dense hair. Middle tibiae with a sparse short fringe beneath. Hind tibiae with abundant long hair beneath, becoming ferruginous at apex. **Tarsi** beneath with bright ferruginous hair.

Mandibles strongly bidentate, the inner tooth shorter and broader than apical tooth. Both teeth seem longer and less widened than in *pachyodonta*. Labrum truncate at apex, with a small rounded median lobe, and with the apical corners rounded. Antennae rather long for *Micranthophora*. Flagellum stout, joints 5 to 13 distinctly longer than wide. Third antennal joint about equal to 4 plus 5. Apical joint slightly widened, truncate and beveled beneath at apex. Maxillary blades in repose reaching to front coxae. Face moderately narrow, but eyes strongly divergent

above. Facial quadrangle somewhat longer than width at vertex. Seventh tergite obtusely angulate on each side at base, the apical lobes about twice as long as wide, bluntly rounded at apex. Emargination between lobes about twice as wide as either lobe. Disk of seventh tergite with a short median carina, not reaching to base of lobes. Sixth ventrite strongly depressed on apical margin, deeply emarginate in middle, the weltlike boundary of the depression distinct and conforming to the shape of the emargination. Legs ordinary. Labrum shining, sparsely punctured. Face, including clypeus, finely and closely punctured, but anterior part of white band polished and impunctate. Ocellar region and vertex behind the ocelli densely punctured, but with two impunctate shining lines forming a right angle, pointed forward, between the posterior ocelli. Concave area between ocelli and eyes closely punctulate. Thorax closely punctured, the two impunctate areas on middle of mesoscutum rather small. Length, 8 to 9 mm., anterior wing, 6.5 to 6.75 mm.

FEMALE.—Similar to male. Black, with large mark on mandibles, labrum except two subhyaline pustules at base, most of clypeus, minute lateral mark between clypeus and anterior end of eyes, transverse supraclypeal mark and scape in front, creamy white. Clypeus with a black mark on each side above, rounded beneath, so that more than anterior half of clypeus and a broad median extension above is pale. Anterior margin of clypeus very narrowly testaceous brown. Pygidial plate castaneous. Flagellum black. Other parts colored about as in male. Pubescence more or less ochraceous on vertex, notum of thorax and abdomen, and whiter on other parts. Face hairy at sides and on the frons, but the white markings left well exposed. Mesonotum with short erect fairly dense pubescence. Tergum of abdomen densely covered with fine short appressed pubescence, but base of first tergite with erect, rather short hair. Triangular hair area on fifth tergite fuscous or blackish. Hair of legs whitish or very pale ochraceous. Front femora with a long white fringe beneath. Front tarsi fringed behind with long hairs, but not densely. Tarsi beneath with brownish ferruginous hair, appearing darker or lighter in different lights. Labrum rounded in front, subrugose, finely punctured. Face below antennae gently convex, the clypeus not prominent. Clypeus with moderately close, irregularly spaced punctures. Facial quadrangle almost as wide at vertex as long. Third antennal joint about as long as the next three combined. Joints of flagellum mostly about as long as wide. Mesonotum densely punctured, subopaque, except two small shining impunctate areas on disk of scutum. Pygidium acute at apex, the disk medially with a rounded longitudinal crest, higher and wider at the middle of the plate. Length, 8 to 9 mm., anterior wing, 6.1 to 6.6 mm.

Described from 9 ♂, 1 ♀ (holotype male, allotype and paratypes) at flowers of *Pluchea sericea*, Furnace Creek, Death Valley, California, May 1, 1927 (Timberlake); 4 ♂, 2 ♀ (paratypes), Coachella, Riverside County, May 13, 1917 (Van Duzee), in collection of California Academy of Sciences; and 14 ♀ (paratypes), on *Pluchea sericea*, Westmoreland, Imperial County, May 31, 1930 (Timberlake).

#### ***Anthophora emarginata*, new species**

*A. emarginata* is similar to *A. rhodothorax* Michener, which I have not seen but differs from the description of the latter in having the yellow band of clypeus usually produced upward in middle to dorsal margin, vertex and mesonotum with more or

less black hair in both sexes, tuft of hair at apex of fifth tergite in female small and usually concolorous, apical margin of tergites in male testaceous instead of ferruginous or fulvous, and the size somewhat smaller. The pubescence in *emarginata* varies from ferruginous to ochraceous and grayish white.

MALE.—Black, the mandibles except reddish piceous tips, labrum, broad anterior band on clypeus, transverse supraclypeal mark and under side of scape, yellow. Clypeal band reaching to eye margins and sometimes with a median spur to dorsal margin. Flagellum dark. Small joints of tarsi ferruginous, the claws reddish piceous except at base. Tibial spurs testaceous. Tegulae piceous, often more or less testaceous on outer margin. Wings dusky hyaline, the veins black. Apical margin of tergites, especially 3 to 6, testaceous. Apical teeth of seventh tergite testaceous at apex. Eyes green. Pubescence dark ferruginous, becoming ochraceous on cheeks, face and under side of thorax, but often varying to ochraceous or grayish white. Vertex and middle of mesonotum with more or less black hairs, sometimes absent on vertex. Head and thorax with the hair moderately long, not very dense, becoming thinner and short on disk of mesoscutum, where the surface is well exposed. Pubescence of abdomen appressed, feltlike, concealing the surface, but longer and erect on base of first tergite. Base of second tergite with a broad black band at base, and next four tergites with a narrow black band (more or less concealed when segments are retracted), where the hair is very short, black, not feltlike. Venter with extremely fine appressed sericeous pubescence, much longer and denser on segments 4 and 5. Hair of legs concolorous with that of under side of thorax, varying from dark ochraceous to grayish white. Outer side of tibiae densely covered with appressed hair. Hair on under side of tarsi bright ferruginous.

Inner tooth of mandible about as broad and blunt as the apical tooth. Clypeus moderately convex, shining, minutely punctured, the yellow part more sparsely and obscurely punctured. Eyes larger and face distinctly narrower than in *A. curta* Provancher. Facial quadrangle nearly twice as long as width at clypeus. Third antennal joint slightly longer than next two joints combined. Fourth joint much shorter than fifth. Vertex shining, minutely and densely punctulate on each side next to eyes, impunctate in concave area on outer side of lateral ocelli, and more coarsely punctured in a triangular area between and behind ocelli. Mesonotum shining, closely and finely punctured, the punctures usually becoming a little sparser each side of median line a little behind the center of scutum. Apical teeth of seventh tergite slightly divergent, nearly twice as long as wide, broad and blunt at apex, and separated by a triangular notch hardly wider than width of either tooth. Lateral teeth small and black. Basal vein received a little behind nervulus. First recurrent vein received by the second submarginal cell at the middle. Legs ordinary. Length, 7 to 8 mm., anterior wing, 5.5 to 6 mm.

FEMALE.—Similar to male except in usual sexual characters. Face marking similar, except scape entirely black. Tegulae testaceous brown. Pubescence similar, but black hairs of vertex and mesonotum much more abundant. Abdomen covered with fine feltlike hair, except a subapical band on tergite 1 and a basal band on tergite 2, which appear black. Sometimes a narrow black band appears on base of tergites 3 and 4, when segments are extended. Triangular brush of hair at apex of tergite 5 usually concolorous, but varying to ferruginous brown or even black. Hair of legs ochraceous, or more or less ferruginous in brighter colored specimens. Hair on under side of tarsi ferruginous. Fan of hairs at apex of hind basitarsi fer-



ruginous, varying to fuscous, or tipped with fuscous. Third antennal joint almost equalling the next three combined. Fourth joint a little shorter than fifth. Punctuation of clypeus and vertex considerably coarser and sparser than in male, but that of mesonotum nearly the same. Apical tooth of mandible about twice as broad as inner tooth. Pygidium moderately narrow, acute at apex, ridged down the middle, and dark reddish to piceous in color. Length, 7.5 to 9.5 mm., anterior wing, 5.3 to 6.1 mm.

Described from 13 ♂, 73 ♀ (holotype male, allotype and paratypes), Riverside, California, the males collected between August 26 and September 24 at flowers of *Gutierrezia californica* and *Corethrogyne filaginifolia* var. *bernardina*, the females at the same flowers and *Ericameria palmeri*, between September 10 and November 14 (Timberlake); and 3 ♀ (paratypes), Claremont, California (Baker).

The type and allotype represent the brightly colored end of the series, which is considerably outnumbered by the grayish specimens.

#### ***Anthophora californica albomarginata*, new subspecies**

Similar to *A. californica* Cresson and *A. californica texana* Cresson in both sexes, but differing in having no black hair on vertex and mesonotum, the white bands of abdomen considerably broader, and the disk of the tergites with thin pale subappressed pubescence.

**FEMALE.**—Black, the mandibles reddish in middle, the basal part of the reddish area suffused with yellow. Flagellum obscurely dark reddish beneath. Tegulae, small joints of tarsi and tibial spurs ferruginous. Wings nearly clear hyaline, the veins piceous, becoming ferruginous at wing base. Apical tegumentary band on tergites 1 to 4 broad, chalky white, that on 2 to 4 narrowed sublaterally in front on each side. Pubescence of vertex and mesonotum fulvo-ochraceous, rarely with a trace of black hairs intermixed. Pubescence of other parts of body white or whitish. Disk of tergites 2 to 4 with thin short subappressed pale hair, more or less overrunning the white bands, but bases of these segments with inconspicuous black hair. Otherwise mostly as in *californica*, which has much black hair intermixed on vertex and mesonotum, and disk of tergites 2 to 4 with short erect black hair. Length, 11 to 13 mm., anterior wing, 8 to 9 mm.

**MALE.**—Similar to the female, except in sexual characters, and structurally like *californica* and *californica texana*. It differs from both *californica* and *texana* in having the face markings pale yellow, the white band at apex of tergites 1 to 6 considerably broader and more sinuate in front, and hair of abdomen mainly whitish and subappressed. (Hair on disk of tergites in *californica* slightly longer, erect and black; in *texana* subappressed and black; but both have hair on first and last segments light, and more or less light hair along lateral margins of abdomen.) Vertex and mesonotum without black hairs intermixed (many black hairs intermixed in *californica*, but none in male of *texana*). Tegulae and tarsi ferruginous red. Flagellum somewhat reddened beneath. Length, about 12 mm., anterior wing, 8 mm.

Described from 1 ♂, 7 ♀ (holotype female, allotype and paratypes) at flowers of *Prosopis juliflora*, 5 1/2 miles west of Indio (at junction of

La Quinta and Palm Springs-Indio road), April 7 and 9, 1936 (Timberlake); 1 ♀ (paratype), Coachella Valley, Riverside County, June 14, 1933 (Margaret L. Cook); and 2 ♀ (paratypes), at flowers of *Sphaeralcea* and *Lycium fremontii*, Westmoreland, Imperial County, California, May 31, 1930 (Timberlake).

***Anthophora fulvicauda*, new species**

Coming nearest to *A. urbana* Cresson but much larger, apex of abdomen of female with fulvous hair, the tarsi of male dark, with black hair beneath, hind basitarsi with a blunt projecting angle on anterior margin; tibial spurs of both sexes nearly black, etc.

FEMALE.—Black, the small joint of tarsi slightly reddened, the base of claws red; integument of tergites 5 and 6 more or less ferruginous red and the venter somewhat reddened especially at the sutures. Tegulae ferruginous. Wings hyaline, a little dusky in apical area and along anterior margin. Veins black. Antennae nearly black. Pubescence ochraceous, paler beneath and on the face and cheeks, much grizzled with black on the mesonotum, the vertex with much black hair. Tergite 1 with pale ochraceous hair, erect at base, becoming appressed and forming a fascia at apex. Tergites 2 to 4 with apical fascia of dense appressed pale hair (as in *urbana*), the band becoming narrower on 4. Area in front of bands with thinner, mostly appressed light hair (with black hair in *urbana*). Hair on tergite 5 and on sides of 6 golden fulvous, but hair at sides of 5 becoming pale ochraceous or whitish. The apical fringe on ventrites 2 to 6 fulvous, becoming whitish on 1 and at sides of 2 to 4. Hair of legs, especially of tibiae and tarsi ochraceous, strongly tinged with fulvous on front and middle tibiae and tarsi. Front femora with long white hair, the middle and hind femora with short hair. Hair on under side of tarsi and on under side of hind tibiae dark ferruginous, sometimes shaded with black. Fan at apex of hind basitarsi golden fulvous. Face broad, the eyes not diverging above. Clypeus convex, subrugosely, closely punctured. Bare concave space between ocelli and eyes shining, minutely punctured. Mesonotum very minutely granular tessellate and opaque. Scutellum and pleura closely obscurely punctured. Third antennal joint equal to the next three joints combined. Basal vein interstitial with nervulus. First recurrent received by second submarginal cell distinctly beyond the middle. Length, about 16 to 18 mm., anterior wing, 10.5 to 11.5 mm.

MALE.—Similar to the female and to the male of *A. urbana*. Black, with small spot on base of mandibles, labrum, clypeus, supraclypeal mark, lateral marks, and scape beneath (all almost precisely as in *urbana*), white. Flagellum beyond the fourth joint a little reddened beneath. Apical margin of tergites more or less whitish hyaline beneath the bands. Pubescence as in the female except that the vertex and mesonotum have less black hair and in one paratype none at all. (*Urbana* male has little or no black hair on these parts, although the female has considerable.) Hair on under side of tarsi and under side of hind tibiae blackish, with a reddish luster in some lights. Tergites 1 to 5 banded as in female, the band on 6 more golden. Hair on disk of tergites 1 to 6 black. Femora with white hair beneath, a little longer on front pair. Hair on outer side of tibiae and basitarsi golden ochraceous, mostly short and appressed. Eyes slightly diverging above (not so strongly as in male *urbana*). Third antennal joint a little longer than next two joints combined. Seventh

tergite with a bare pygidial area in middle, the sides with dense appressed golden hair. Apex of pygidial area moderately wide, a little rounded, and on each side at a lower level a small black acute tooth. Hind femora somewhat incrassate. Hind basitarsi rather broad, more than twice as wide as middle pair, the anterior margin with a short blunt tooth a little beyond the middle. Ventrite 6 deeply angularly notched in middle. Length, 11 to 13 mm., anterior wing, 8.9 to 10.3 mm.

Described from 1 ♂, 6 ♀ (holotype female, allotype and paratypes), collected at flowers of *Phacelia ramosissima* var. *suffrutescens* and *Scrophularia californica* var. *laciniata*, Riverside, California, May 31 to June 20 (Timberlake); 2 ♂ (paratypes) at flowers of *Beloperone californica*, Palm Canyon, Borego Valley, San Diego County, March 29, 1936 (Timberlake), and 1 ♂ (paratype) at flowers of *Eriodictyon crassifolium*, Andreas Canyon, near Palm Springs, Riverside County, April 24, 1932 (Timberlake).

#### *Anthophora dammersi*, new species

Like the preceding species, this runs to *A. urbana* Cresson and *A. washingtoni* Cockerell in Cockerell's table (1906), but it is much larger, nearly equalling *fulvicauda* in size, with hair at apex of abdomen fulvous, and hair band at apex of tergite 4 interrupted in middle. The female may be distinguished from *fulvicauda* by having the third antennal joint much longer, disk of tergites 2 to 4 with black hair in front of the band, the bands narrow and white. The male of *dammersi* differs from all the others in having middle tarsi densely clothed on outer side with a long brush of ferruginous hair.

**FEMALE.**—Black, the small joints of tarsi a little reddened, the tibial spurs nearly black. Tegulae ferruginous. Pubescence ochraceous or whitish, more or less white on face, cheeks and under parts of thorax and the abdomen. Vertex with much black hair and hair of mesonotum strongly grizzled with black. Hair of first tergite long and erect, but the apex with a narrow white band of shorter depressed hair. Tergites 2 to 4 with a narrow white apical hair band, that on 3 a little thinner in middle, that on 4 thinner and interrupted in middle. Apex of tergite 5 and sides of the pygidium with bright fulvous hair. Disk of tergites 2 to 5 with erect black hair, considerably longer on 4 and 5, but base of 2 with short erect white hair. Hair of venter much as in *fulvicauda*, but the apical fringes much longer. Hair of legs mostly ochraceous, but long fringe on front femora whitish, and hair on outer side of tarsi, anterior margin of middle tibia and hind margin of front tibia bright fulvous. Hair on inner side of tarsi dark ferruginous, margined with black on hind basitarsi, and hair on inner side of hind tibiae blackish. Fan of hair at apex of hind basitarsi bright fulvous. Hair on labrum golden. Wings dusky hyaline, the veins black. Face broad, the eyes hardly diverging above. Clypeus convex, closely, shallowly punctured. Concave space between ocelli and eyes shining, very minutely punctulate. Mesonotum dullish, very finely tessellate, and with close fine shallow punctures, except on small oval area on each side of middle on posterior part of scutum. Third antennal joint about as long as next four joints combined. Mandible when not worn has inner tooth at a considerable distance from apex and the shaft distinctly constricted half

way between inner tooth and base. Pygidium rather narrow, acute at apex. (In *fulvicauda* pygidium broad at base, ogivally narrowed to a rounded apex.) Length, 13 to 16 mm., anterior wing, 10.5 to 11.8 mm.

MALE.—Similar to the female, except in usual sexual characters, the white bands on abdomen poorly developed and soon worn off. Black, the labrum except reflexed margins and basal spot on each side, clypeus, transverse supraclypeal mark, lateral marks and under side of scape, white. Clypeus with small black sutural spot on each side in type but frequently with a broad black band, following suture from top generally not quite to anterior end. Lateral marks strongly concave above, the orbital extension reaching above antennal sockets. Small joints of tarsi ferruginous, but the apical joint and claws darker. Apex of tergites 1 to 6 whitish hyaline. Pubescence of head and thorax as in the female, the vertex with a few black hairs (many black hairs on vertex in males from Riverside and Perris). Hair of first tergite as in female, the apical band less distinct. White bands on apex of tergites 2 to 5 thin and soon worn off, apparently sometimes never developed on 4 and 5. Disk of tergites 2 to 6 with erect black hair, except base of 2, where the hair is white. Apex of 6 and nearly whole of 7 covered with pale fulvous to whitish hair. Hair of legs whitish, becoming blackish on inner side of hind tibiae, and dark ferruginous on inner side of tarsi. Outer side of tibiae with thin hair, becoming dense on hind margin. First four joints of middle tarsi on outer side and anterior margin of middle tibiae at apex covered with coarse rather long dark ferruginous hair, forming a dense brush, the apical joint of tarsus comparatively nude. Inner tooth of mandible much closer to apex than in female. Clypeus somewhat dullish, very finely and obscurely punctured. Third antennal joint somewhat longer than next three joints combined. Hind basitarsi hardly wider than middle pair and quite simple. Hind femora not incrassate. Apex of pygidial area nude and truncate, the sides of the segment obtusely angled near base. Apex of sixth ventrite with a broad, very shallow emargination. Length, about 12.5 to 15 mm., anterior wing, 10 to 11 mm.

Described from 3 ♂, 8 ♀ (holotype female, allotype and paratypes), at flowers of *Salvia carduacea*, Lovejoy Buttes, 7 miles north of Llano, Mohave Desert, California, May 2, 1937 (Timberlake); 1 ♀ (paratype), Kramer Hills, Mohave Desert, March 20, 1931 (C. M. Dammers); 1 ♀ (paratype), Michel's Cavern, San Bernardino County, May 18, 1935 (Dammers) in Dammers collection; 1 ♀ (paratype), Bonanza Mine, Providence Mountains, at flowers of *Amsinckia*, April 10, 1936 (Dammers); 1 ♀ (paratype) Gavilan Hills, 5 miles west of Perris, on *Ribes indecorum*, March 19, 1936 (F. R. Platt); 1 ♂ (paratype) at flowers of *Astragalus pomonensis*, 2 miles west of Perris, March 19, 1936 (F. R. Platt), this pair in Platt collection; 1 ♂ (paratype), Riverside, on *Amsinckia intermedia*, March 23, 1933 (Timberlake); and 12 ♂, 1 ♀ (paratypes) Palm Canyon, Borego Valley, San Diego County, 7 of the males collected by Dammers, March 14, 15, 1936 (2 in Dammers collection), the rest by Timberlake, March 29, at flowers of *Beloperone californica*.



***Anthophora crotchii* Cresson**

*A. crotchii* is a rather common vernal species in California. Cresson described only the male, which is a beautiful insect and easily known by its bright fulvous pubescence, yellow face and black fan at apex of middle tarsi. After collecting in California for several seasons I wondered why I could find no female to match with *crotchii*. At the same time I found the female of *A. washingtoni* Cockerell and wondered what its male could be like. This female looks very different from *crotchii* male, having a pale pubescence and narrow, white bands on the abdomen. I finally concluded that *washingtoni* must be the female of *crotchii* in spite of the decided differences. They both have greenish eyes, unlike the other large vernal species, and frequent the same flowers. I have taken both at flowers of *Amsinckia* and *Lantana* which are attractive to all the vernal *Anthophora*, but both also visit the flowers of *Orthocarpus purpurascens*, which do not seem to attract any of the other species. I have also observed the *crotchii* male following and pouncing on the *washingtoni* female, so that the association of the two as the sexes of one species seems to be correct.





